

【Grant-in-Aid for Scientific Research (S)】

Humanities and Social Sciences (Humanities)



Title of Project : Seeking the onset of infant speech development: An explanation of developmental mechanisms from the perspective of Asian languages

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Research Area : Developmental Psycholinguistics

Keyword : Infant Speech Perception

【Purpose and Background of the Research】

It has been commonly hypothesized that infants are capable of discriminating all phonetic contrasts, including those not in their native language, and that such broad abilities decrease as the infant develops. This is called the *Perceptual Narrowing Hypothesis*. However, the hypothesis was formed on the basis of a small number of studies that found that infants surrounded by English and a few other European languages are capable of discriminating some sound contrasts that do not exist in their native languages, such as Thai stop sounds and Cantonese tone contrasts. It remains unclear whether this is an absolute phenomenon, or whether there are indeed sounds that require prior experience (exposure, maturation, etc.) before an infant can discriminate them.

This project tests the perceptual narrowing hypothesis by experimentally testing infants native to four Asian languages (Thai, Korean, Cantonese, and Japanese) on their ability to discriminate native and non-native sound contrasts.

【Research Methods】

Infants will be tested at Thammasat University in Bangkok, Thailand; Hong Kong University in Hong Kong; Chung-Ang University in Seoul, Korea; and RIKEN Brain Science Institute in Japan. As shown in Figure 1, the four languages included in the present study represent four distinctive types of stop contrasts. In addition, Thai and Cantonese are tone languages; standard Japanese is a lexical

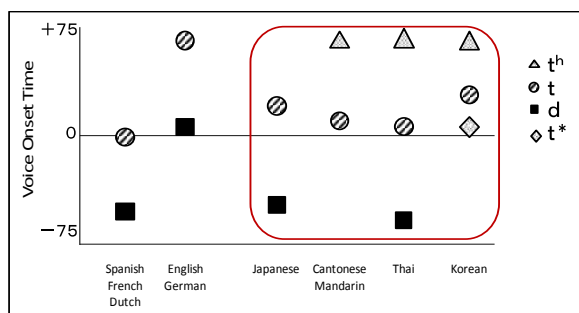


Figure 1. Variation in Stop contrasts

pitch-accent language; and the Seoul dialect of Korean uses no lexical level prosody. These features make it ideal to test infants' ability to discriminate these contrasts. Using a Visual Habituation-Dishabituation paradigm, 4-6 and 8-10 month infants will be tested in each country on their ability to discriminate native and non-native contrasts in stop sounds as well as differences in tone patterns and pitch-accents.

【Expected Research Achievements and Scientific Significance】

This will be the first study that compares infants native to Asian languages on their ability to discriminate speech contrasts in experiments. The comparison will allow us to critically evaluate whether perceptual narrowing applies equally to infants learning non-European languages.

Our prediction is that, unlike the claim of the perceptual narrowing hypothesis, infants are not able to discriminate all speech contrasts, but only those that are marked with perceptually salient cues. If our prediction is supported experimentally, it will constitute a significant advance in research on infant speech perception.

【Publications Relevant to the Project】

- Mazuka, R., Hasegawa, M., & Tsuji, S. (2014). Development of non-native vowel discrimination: Improvement without exposure. *Developmental Psychobiology*, 56, 192-209.
- Sato, Y., Kato, M., & Mazuka, R. (2012). Development of single/geminate obstruent discrimination by Japanese infants: Early integration of durational and non-durational cues. *Developmental Psychology*, 48(1), 18-34.

【Term of Project】 FY2016-2020

【Budget Allocation】 87,200 Thousand Yen

【Homepage Address and Other Contact

Information】 <http://lang-dev-lab.brain.riken.jp/>